

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION.

### Process for Preparing Fruit and Vegetable Juices in Powder Form.

We, LEDOGA S.p.A., an Italian Body Corporate, of 10 Via Roberto Lepetit, Milan, Italy, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a process for preparing fruit and vegetable juices in powder form.

The difficulties attendant in the preparation of fruit and vegetable juices in powder form which are satisfactory both from the point of view of taste and flavour and the point of view of storage stability are well known in the art. Hitherto, powdered fruit and vegetable juices to be used for making, for example, instant fruit beverages, vegetable cocktails and instant soups, and for flavouring various food products, have been usually admixed with inert filler substances, which are also unaffected by the acidic substances almost invariably present in fruits and vegetables, such as pectoalbumins, gelatins and lactose, and these inert additives frequently impair the solubility of the powdered fruit and vegetable juices admixed therewith and unfavourably affect the natural flavour and the taste of the product. However, the use of the inert filler has hitherto been desirable since the majority of the fruit and vegetable juices contain reducing sugars, which tend otherwise to impart a pasty or semi-fluid consistency to the resulting fruit or vegetable concentrates.

In attempts to overcome the above disadvantages reduced pressure and other technical expedients have been tried and added only small improvements.

It has been proposed to employ sucrose, for example in the form of common cane or

beet sugar, as the inert filler, because of its low cost and ready availability. However, sucrose is unsatisfactory in that the acidity of the fruit juice very often causes inversion. It has been found, in fact, that by admixing even large amounts of sucrose (1 part of fruit juice for 10 parts sucrose, by weight) with fruit juices, the admixture was reduced after a period of time into a mass having the consistency and the gelatinous character of invert sugars. Moreover, this inversion is promoted by the high acidity of the fruit or vegetable concentrates and also by the presence of hygroscopic salts which, by absorbing moisture from the atmosphere, cause agglomeration and then liquefaction of the fruit juice powders.

According to the present invention, there is provided a process for preparing a fruit or vegetable juice in powder form, which comprises reducing the fruit or vegetable to juice or pulp, admixing xylitol therewith, and removing sufficient water from the mixture to reduce the same to powder form.

The fruit and vegetable juices in powder form may be conveniently stored for a considerable period of time in fluid-tight receptacles without depreciation of taste or flavour and without inversion of the sugars content occurring.

The free flowing lump-free powders produced by the process of this invention may be readily converted to beverages, cocktails, soups or the like, by admixture with water. The amount of xylitol added is not critical, particularly since it is an edible, harmless and non-toxic substance.

In carrying out the process according to the invention, the xylitol may be admixed with the juice or pulp and the water removed from the resultant mixture by

evaporation under reduced pressure. Alternatively the juice or pulp may be partly or wholly concentrated by evaporation before the addition of the xylitol, and the remainder of the moisture removed after the addition. It is preferable to remove at least 90% of the water from the fruit or vegetable juice.

The following examples illustrate the invention:—

#### EXAMPLE 1.

One kilogram of pineapple juice, which is an acidic fruit juice, was admixed with 100 grams of xylitol. The mixture was concentrated under vacuum, the residual pressure being suitable for preserving the taste and flavour of the fruit while removing the undesired water content. The pressure is not critical in any way and can be selected according to the individual requirements and plant facilities. Once the required degree of dryness is obtained, the mixture was powdered and packed in fluid-tight containers. Edible flavouring and colouring substances may be added, if desired, prior to sealing.

#### EXAMPLE 2.

One kilogram of apricot juice, which is an acidic fruit juice, was admixed with 30 grams of xylitol, which was dissolved in the juice and the solution concentrated in vacuo until dry. The dried mixture was added to 50 grams of xylitol and thereafter powdered and packed in sealed containers.

#### EXAMPLE 3.

Two kilograms of banana mash (which is a non-acidic fruit pulp) containing 75% by weight of water were admixed with one kilogram of xylitol and evaporated in vacuo until the final mass contained not more than 10% by weight of water. A flour-like product of agreeable taste and flavour was obtained which did not contain lumps as are found in conventional banana-flour and which was more easily dispersible in water.

The procedure of this example was found to be equally successful when applied to other fruits, such as fruits of the genus Anonoceae, carob beans, dates and date plums.

#### EXAMPLE 4.

500 grams of xylitol were added to 2 kgs. of homogenized carrot (a non-acidic vegetable pulp) mash and the mixture dried in vacuo until the final mass contained not more than 10% by weight of water. A readily dispersible product was obtained, which had a concentration of carrot equal to twice that of the original mash.

The procedure of this example was found to be applicable also to other vegetables, such as cucumbers, gherkins, lettuce, spinach, cabbage, celery, tomatoes and Savoy cabbage.

#### WHAT WE CLAIM IS:—

1. A process for preparing a fruit or vegetable juice in powder form, which comprises reducing the fruit or vegetable to juice or pulp, admixing xylitol therewith and removing sufficient water from the mixture to reduce the same to powder form.

2. A process according to Claim 1, wherein the fruit or vegetable juice in powder form is thereafter introduced into fluid tight receptacles for preservation.

3. A process according to Claim 1 or 2, wherein the water is removed by evaporation under reduced pressure.

4. A process according to any preceding claim wherein at least 90% of the water content of the fruit or vegetable is removed.

5. A modification of the process claimed in any preceding claim, wherein the water is first removed from the fruit or vegetable juice or pulp and xylitol is thereafter admixed therewith.

6. A process for preparing a fruit or vegetable juice in powder form, substantially as described in any one of the foregoing examples.

7. A fruit or vegetable juice in powder form, whenever prepared by the process claimed in any preceding claim.

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